



DIGITAL INTERNATIONALIZING FIRMS (DIF'S): A SYSTEMATIC LITERATURE REVIEW AND FUTURE RESEARCH AGENDA

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Abstract

This article analyzes the content and evolution of the research in the field of International Business and Entrepreneurship to describe the state of the art of the literature on born digital firms and their internationalization, to identify the themes that recurred during the last two decades, and to highlight trends and future research perspectives in these fields. We conducted a rigorous search of articles published in high impact journals. The main findings reveal that there is still no consensus on the definition of digital firms and their internationalization processes. Future research should advance in this aspect. Likewise, it is both needed and important to conduct more empirical research that analyze the international expansion of born digital firms and their internationalization patterns. In response to this, we examine in the extant literature how mainly digital companies base on their digital business models to internationalize. Although there are still few academic publications regarding how digitalization of the business model affects born digital firms' internationalization, the number of articles is widely increasing in the field of International Business and Entrepreneurship, as are opportunities for future research.

1. Introduction

Digital technologies are disrupting traditional industries and the global economy. Examples of new information technologies infrastructures, Internet of Things (IoT), Artificial Intelligence (AI), Blockchain, High-speed internet and Wireless technology, and other information and communications technologies (ICTs) are generally referred to as “digitalization”.

To companies, digitalization means opportunities for transform and/or create new business models, spanning from marketing and sales channels to logistics. The use of advanced digital information and communications technologies allow companies to identify opportunities for improvement, provide challenges to growth and share international activities. Digitalization is transforming how International Business (IB) is conducted (Coviello, Kano and Liesch, 2017; Alcácer, Cantwell and Piscitello, 2016; Vahlne and Johanson, 2017). Digitalization enables some firms to reach high levels of internationalization very rapidly and with limited investment in foreign assets (The United Nations Conference on Trade and Investment (UNCTAD, 2017).

Prior research indicates that digital firms may follow different internationalization patterns and adopt different operating modes that conventional firms (Autio and Zander, 2016; Mahnke and Venzin, 2003; Yamin and Sinkovics, 2006). Empirical studies suggest that the internationalization process of digital firms goes from regional to international, and finally global, using adaptations such as language translations to overcome barriers (Mahnke and Venzin, 2003; Brouthers et al., 2016). They position their products or services for a niche market, and they adapt very quickly to control it (Hennart, 2014; Autio, 2017). Other empirical studies on digital start-ups producing digital innovations (e.g., mobile apps) analyse how these firms base their businesses on online platforms or marketplaces to internationalize rapidly (Shaheer and Li, 2018). Using a high degree of digitalization of the value chain, digital companies coordinate the value chain activities with Internet-enabled technologies (Hennart, 2014; Hazarbassanova, 2016). The centre of decisions is generally the home country (Mahnke and Venzin, 2003). However, it is also argued that these companies prefer to enter international markets via controlled modes (e.g., subsidiaries) (Sinkovics, Sinkovics, and Jean, 2013). Based on this, digital companies cannot activate in a market without being partly present offline, in general, because of legal compliance and market-specific requirements (e.g., a dependence on local e-commerce merchants) (Wentrup, 2016). Moreover, these firms should deal with greater Liabilities of Outsidership (LoO), since the main concern is the creation of a large enough network of users to generate value on its platform, and create thick ecosystems in new countries (Brouthers et al., 2016).

Unfortunately, studies on digital firms published in the last two decades

suffer from a lack of clarity in the adoption of definitions and recent research includes different samples of Internet-related firms. Little research has been done regarding the emergence of a new type of digitalized (Internet-based) company (Bell and Loane, 2010; Brouthers et al., 2016; Wentrup, 2016), which bases its business model on the latest digital technologies. As a foundation for considering what might be a “born digital” firm, we refer to UNCTAD (2017) to distinguish between Information and Communications Technology (ICT) firms and those that are digital.

In this sense, the aim of this paper is to contribute on this aspect by performing a systematic literature review of central academic papers analysing the content and evolution of the research in the fields of International Business and Entrepreneurship, to develop a more complete understanding of how born digital firms internationalize. Thus, the goals of the review are as follows: to describe the state of the art of the literature on born digital firms and their internationalization patterns, to identify the themes that recurred during the period 2000 and 2018, and to highlight trends and future research perspectives in the fields of International Entrepreneurship and International Business. As one of the implications, this study aims at serving as a summary and starting point for scholars and practitioners interested in internationalized digital firms’ phenomenon. Future research should advance in this aspect. The main findings reveal that there is still no consensus on the definition of digital firms and their internationalization processes. In so doing, we attempt to discuss some shortcomings of research at a methodological and thematic level offering insights into how such limitations could be addressed. To achieve this, we structure this paper in six sections as follows. The initial theoretical framework is discussed in the second section. In section three, we present the methodology to analyse systematically the literature that uses digital dimensions as a framework in international business and international entrepreneurship research published in high impact journals between 2000 and 2018. The discussions based on the findings are given in section four and directions for future research are outlined in section five. Our conclusions are reported in the last section.

2. Theoretical Framework: Regarding Born Digital Firm definition and its internationalization process

2.1 Digitalization and born digital firms

Extant research use different terms like ibusiness (Brouthers et al., 2016), high-tech firms (Almor, Tarba, and Margalit, 2014; Ojala and Tyrvaenen, 2006), digital information goods providers (Mahnke and Venzin,

2003; Wentrup, 2016), new technology-based firms (Bell and Loane, 2010; Campos et al., 2009; Mahadevan, 2000; Reuber, 2016), accidental internationalists (Hennart, 2014), or application service providers (Susarla, Barua, and Whinston, 2003), but they view digitalized companies as any firm operating online that provides its products/services to customers using the Internet and other digital, IC-based technologies (Bell and Loane, 2010; Wentrup, 2016; Nambisan, 2017). Other authors define a digital firm as an organization where nearly all significant business processes and relationship with customers, suppliers, and employees are digitally enabled and mediated, and key corporate assets are managed through digital means (Laudon and Laudon, 2018). Digital firm offers extraordinary opportunities for more flexible global organization and management.

As we mentioned before, our foundation for considering what might be a ‘born digital’ firm, follows The United Nations Conference on Trade and Investment (UNCTAD), in its 2017 World Investment Report to distinguish between Information and Communications Technology (ICT) firms and those that are digital. ICT firms include manufacturers of hardware and components (e.g., Samsung, Toshiba), software and service firms (e.g., Oracle, Adobe Systems), or telecoms that provide the infrastructure for communication (e.g., Vodafone, Deutsche Telekom). In contrast, a digital firm relies on the internet for its production, operating and delivery processes. These include internet platforms (e.g., Alphabet, Yahoo, Facebook, Twitter) and providers of digital solutions (e.g., Automatic Data Processing, PayPal, Global Payments), that operate entirely in a digital environment, and e-commerce (e.g., Amazon, Alibaba, Expedia) and digital content firms (e.g., Comcast, Time Warner, Netflix, Spotify), that combine a prominent digital dimension with a physical one.

Therefore, to avoid confusion, we may adopt the term “born digital firm” to denote firms whose business models are based on digital ICTs (e.g., big data, robotics, artificial intelligence, among others), and whose products and services can be delivered virtually over the internet (Coviello et al., 2017; Mahnke and Venzin, 2003). Thus these firms provide digital goods and services and may also possess a fully or partially digitalized value chain. Digital goods and services are broadly defined as “experience goods encoded as a string bits” (Mahnke and Venzin, 2003, pg.119): *“the goods do not perish or require transportation; have no diminishing return to scale; have great benefits of economies of scale; might inherit network effects; might produce valuable data”*. This particular type of firm has the above characteristics, and it is also digital from inception.

In this sense, we classify born digital firms in two main categories regarding its type of digital business model. The “purely born digital firms” which includes digital platforms, providers of digital solutions, and digital content producers/distributors of goods and services in digital format. In the second

category called “mixed born digital firm” we include only full online and on-line-born commerce companies which are involved in both digital and physical products and services distribution, basically Internet retailers and e-commerce platforms. These definitions restrict the concept of digital firm to those companies whose business is digital. Therefore, ICT companies that provide the enabling infrastructure that makes the Internet accessible to individuals and business (hardware, software and telecom firms) and e-commerce channel of traditional business and multichannel retailer are excluded.

2.2 Digital internationalization process theories

Extant International Business (IB) research on digital firms has applied two broad types of internationalizations process theories: the Uppsala model, as well as the more recent theory on International New Ventures (INVs) and born global firms.

First formulated by Johanson and Vahlne in 1977, the Uppsala model, also known as the stage model or the U-model, is one of the most influential theories explaining firms’ internationalization (Oviatt and McDougall, 2005; Schueffel et al., 2014). The internationalization is described as slow and incremental (Oviatt and McDougall, 2005), and the model assumes that the firm’s overarching goal is to strive for growth and long-term profit while trying to keep risk taking at a low level (Madsen and Servais, 1997). At the time, IB was mainly developed for multinational enterprises (MNEs). Notably, Johanson and Vahlne (2009) have suggested several extensions and clarifications to their original model, emphasising the role of business networks and capability-creating processes (Vahlne and Johanson, 2017).

Within internationalization theory, the phenomenon of small and young firms internationalizing early has opened a new research stream. These firms do not follow the same patterns as traditional firms when internationalizing and many researchers sought to explain why using several theoretical frameworks.

This phenomenon has had many labels: “Born Globals” (Rennie, 1993; Rasmussen and Madsen, 2002), “Global Start-ups, (Oviatt and McDougall, 2005), “International New Ventures” (McDougall and McDougall, 2005; Servais and Rasmussen, 2000; Oviatt and McDougall, 2005; Autio, 2005; Coviello, 2006) and “International Entrepreneurship” (IE) (Oviatt and McDougall, 2005). Moreover, the IE approaches focus on internal factors, capabilities, and networks of a company as reasons for such behavior (Andersson, 2011; Hagen and Zucchella, 2014).

The recent literature suggests that digital firms tend to be INVs or born-global firms (Autio et al., 2017; Brouthers et al., 2016), because their products are “instantly accessible from anywhere in the world” (Brouthers et al., 2016, pg. 514). Compared to traditional modes of foreign market entry, virtual internationalization greatly reduces the cost and risk of expand-

ing (Autio and Zander, 2016). Digital products and services can easily be exported to remote markets, because the Internet permits nearly costless and instantaneous delivery (Hennart, 2014; Mahnke and Venzin, 2003). When value-adding, activities need to be performed in foreign markets, digital ICTs often allow firms to externalize these operations by improving communication and monitoring (Autio and Zander, 2016; Dunning and Wymbs, 2001; Rangan and Sengul, 2009). Scholars have argued that these factors substantially reduce the need for market-seeking foreign direct investment (FDI) (Eden, 2016; UNCTAD, 2017). Digital firms are thought to pursue primarily ‘virtual’ internationalization, i.e., without establishing a physical presence in foreign markets (Singh and Kundu, 2002; Yamin and Sinkovics, 2006).

However, other studies indicate that digital firms follow different patterns of internationalization of INVs, and do not necessarily serve foreign markets from inception. For example, differences in terms of culture, languages, and consumer preferences, among others, may require modifications on products and services to suit local needs (Blum and Goldfarb, 2006, Shaheer and Li, 2018).

There seems to be significant heterogeneity in the extent to which digital firms achieve global reach (Mahnke and Venzin, 2003; Bell and Loane, 2010; Chen, Shareer, Yi, and Li, 2018). Thus, the applicability of the internationalization theories to digital ways of conducting business needs to be challenged.

3. Methodology

We adopted the basic guidelines for a systematic review set out by Tranfield, Denyer, and Smart (2003), identifying relevant articles through keyword searches in two journal databases. Scopus and Web of Science (WoS) were selected as our database due to their wider coverage of articles, highly adaptable search, and more refined options (Mongeon and Paul-Hus, 2016).

To comply with the objective of analyze the content and evolution of the research in the field of Born Digital Firms it was made a systematic literature review (Tranfield, Denyer, and Smart, 2003). This work systematically reviews articles published from 2000 to 2018. This time frame was selected on the assumption that research that is more than 18 years old probably does not collect all the key information in this technologically changing environment.

3.1 Search method and scope

The search criteria comprised articles investigating born digital firms published in the research fields of International Business and Entrepreneur-

ship. Books, book chapters, and conference proceedings were excluded. The scope of the search is related to material published between 2000 and 2018 (both included). The selection of studies is the result of a methodological process that combined electronic means with manual search in two phases. We conducted a keyword search in *Scopus and Web of Science (WoS)* using “international entrepreneurship,” “international business”, “digital firm,” and “digital business models” which are the most influential labels used to describe firms achieving “online internationalization” (Yamin and Sinkovics, 2006; Wentrup et al., 2016; Shaheer and Li 2018). Six filters were applied for the initial searches: the studies included had to (1) be published in the period 2000-2018; (2) be classified as review, theoretical, or empirical academic article; (3) be the search result of Internet-based firms, digital firm, ebusiness, digital platform firm, digital entrepreneurship, ibusiness, digital business models, online internationalization, international business in the Article title, Abstract or Keywords field of the studies; (4) be identified as journal article; (5) appear in high impact journals in the topic Business and Management, and (6) be written in English. Although our systematic search was limited to these journals, our review included research published in other outlets when it was relevant to the discussion. Firstly, through the *Scopus and WoS* search, we obtained 146 articles published in high impact journals.

Since the goal of the review was to conduct an in-depth thematic analysis, we decide to refine and reduce the database articles obtained, by limiting our search to articles focused on 1) firms whose business models are based on digital ICT-based technologies and whose products and services can be delivered virtually over the Internet, (2) factors that encourage firms to use digital technologies to internationalize from inception; or 3) the characteristics of Internet use, at either the firm or the industry level. Each of these articles was read one by one to determine whether it added value to an enhanced understanding of born digital firms and the paths of their internationalization process. In this second phase, the articles that did not fulfilled the three limiting criteria (104 off-topic articles) were excluded. Some examples of excluded articles were those related to firms (SMEs and High Tech but not digitals) that have relied not only on Internet-based channels, but also used combinations of conventional channels and the Internet. This means that born digitals are fundamentally different from bricks-and-mortar firms that have “gone digital” by internalizing digital capabilities into the organization. They also differ from firms that are still in the process of “going digital” by engaging in digital transformation or augmenting their digital capabilities. The final dataset included 42 articles published in 26 journals referring to digital firms and their internationalization process, as shown in Table 1. The dataset of 42 articles is comprised of the 5 reviews, 15 conceptual studies, and 22 empirical studies, of which, 13 qualitative and 9 quantitative studies. The final selected studies are described in Table 2.

Tab. 1: Description of the number of articles published in each journal and Field

Journal	International Business	Entrepreneurship	Marketing	Management Information Systems	Management	Number
Journal of International Business Studies	7					7
International Business Review	4					4
Strategic Entrepreneurship Journal		3				3
Journal of Business Venturing		3				3
Management International Review	2					2
International Marketing Review			2			2
Journal of International Entrepreneurship		2				2
Strategic Management Journal					1	1
Entrepreneurship Theory and Practice		1				1
Multinational Business Review	1					1
Journal of Organization Design					1	1
Journal of World Business	1					1
Journal of Marketing Management			1			1
Management Dynamics in the Knowledge Economy	1					1
Journal of International Marketing			1			1
Information Systems Journal				1		1
Critical Perspectives on International Business	1					1
Entrepreneurial Business and Economics Review		1				1
Computers in Industry				1		1
Baltic Journal of Management					1	1
Canadian Journal of Administrative Sciences		1				1
Technological Forecasting & Social Change				1		1
Journal of International Management	1					1
Review of International Business & Strategy	1					1
MIS Quarterly				1		1
Journal Management Gov					1	1
Number	19	11	4	4	4	42

Tab. 2: Prior literature on different fields regarding Digital Firms and their Internationalization

Field	Studies	Typology of study/Sample	Aim/Research Question
International Business	De la Torre & Moxon, 2001	Conceptual	This study analyses the Impact of ICT conducting international Business.
Management	Amit & Zott, 2001	Qualitative. Sample: 59 american and european e-business	This article analyses Value creation in e-business based on efficiency, complementarities, lock-in and novelty.
International Business	Kotha, Rindova & Rothaermel, 2001	Quantitative Sample: 86 internet B2C firms (MNE)	Focus on Internalization theory, this article analyses how internationalize 86 pure internet firms Business to consumer base on Intangible assets (reputation and website traffic).
International Business	Singh & Kundu, 2002	Conceptual	This study contributes to IB theories identifying the variables affecting the growth of e-commerce corporations. The proposed framework in the study extends the explanatory eclectic paradigm in the context of e-business
International Business	Mahnke & Venzin, 2003	Qualitative Case Study (eBay)	This article examines how product characteristics shape the internationalization process of digital information good providers.
International Entrepreneurship	Loane, McNaughton, & Bell, 2004	Qualitative Case Study. Sample: 10 Irish Internet Start-ups	This paper explores the patterns, pace, and drivers of internationalization and the processes involved to determine the extent to which the Internet has influenced the firms' international activities, behaviour, and overall strategy.
International Marketing	Luo, Zhao & Du, 2005	Quantitative Sample: 93 US companies whose business activities are entirely internet-based from inception	This study aims to explain the internationalization speed of e-commerce companies (ECCs). Based on the archive data of the American ECCs, the study used multiple regression analysis to estimate the influences of many micro- and macro-factors.
International Business	Yamin & Sinkovics, 2006	Qualitative Exploratory case study Sample: 26 firms Engineering sector /United Kingdom's North-West region	This paper examines the effects of online internationalisation on the psychic distance perceptions of internationalising firms. Building on extant internationalisation literatures and exploratory interviews, the authors generate four propositions positing effects of online internationalisation on psychic distance.

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International Business	Forsgren & Hagström, 2007	Conceptual	The purpose of this paper is to examine to what extent classical models of firms' internationalization process can explain behaviour among totally new types of firms (Internet-related firms)
Management	Onetti, Zucchella, Jones, & McDougall-Covin, 2010	Literature review, conceptual Based on 70 definitions published from 1996 to 2009	This paper proposes a framework for the business model of new technology-based firms (those developed their business around a new technological platform). For these firms, strategic decisions and growth processes are characterized by a deep interrelationship amongst the processes of internationalization, innovation and entrepreneurship.
International Marketing	Bell & Loane, 2010	Literature Review	This paper analyses the emergence of a new type of firms "new wave of global small and medium firms". For these firms the Internet is a key driver of business development and speedy internationalisation.
International Entrepreneurship	Reuber & Fischer, 2011	Literature review, conceptual 33 journals published from 2000 to 2010	This paper shows a conceptual model based on online reputation, online technological capabilities, and online brand communities, developed through a comprehensive review of literature in diverse fields: entrepreneurship, international business, management, management information systems, and marketing.
International Business	Pezderka & Sinkovics, 2011	Conceptual	Analyze e-risk perceptions and implications for small firm active online internationalization/entry mode
International Marketing	Sinkovics, Sinkovics, & Jean, 2013	Quantitative. Sample: 115UK-based SMEs involved in active online internationalization	This paper examines the drivers and performance outcomes of two patterns of internet use supporting export marketing: the internet as an alternative to a physical presence and the internet as a sales channel. Specifically, it is unclear how the internet can successfully support export marketing.
International Entrepreneurship	Fisher & Reuber, 2014	Qualitative case study Sample: 8 entrepreneurial firms B2B	The purpose of this paper is reducing the gap in the current literature on entrepreneurial communications to know how growth-oriented entrepreneurial firms can use new media channels such as Twitter to reduce uncertainty and enhance differentiation.

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International Business	Brouthers, Geisser & Rothlauf, 2016	Qualitative Multiple case design Sample: 9 iBusiness firms (B2B, B2C, C2C)	This paper examines how the internationalization process of ibusiness firms will build on concepts dealing with social networks and diffusion theories to move from a user- network outsider to an insider and become embedded in the foreign market user community.
International Entrepreneurship	Wentrup, 2016	Qualitative Sample: 3 On-line Service Providers	This study explores how the On-Line Service Providers (OSPs) internationalize in terms of speed, geography and mode of entry. The paper introduces two theoretical concepts: the online-offline balance and online-to-offline interval.
International Business	Alcácer, Cantwell & Piscitello, 2016	Conceptual	The study examines the changing nature of the competitive advantages of places, the competitive advantages and strategies of firms, and the governance structure of International Business (IB) networks in what has been called the third industrial revolution.
International Business	Hazarbassanova, 2016	Qualitative case study Sample: 3 cases with a different value creation logic. Explore the differences in the scale and speed of their internationalisation (cross-case analysis)	This paper explores how the value creation logic of internet firms (IFs) influence their internationalisation process and they differ from traditional firms.
International Business	Shu, Morschett, & Swoboda, 2016	Quantitative Sample: 150 online retailers (1110 market entries in 47 country markets over 19 years)	This paper identifies and analyses various influence factors on internationalization speed of online retailers and their impact on individual internationalization steps. Grounded in the resource-based view, the paper examines the effects of imitability of an online shop, the presence of venture capitalists, the scope of the country portfolio and distance and diversity within the country portfolio on the internationalization speed of online retailers
International Entrepreneurship	Nambisan, 2017	Conceptual	This paper examines how the new digital technologies have transformed the nature of uncertainty inherent in entrepreneurial processes and outcomes.

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International Entrepreneurship	Etemad, 2017	Conceptual	This article analyses a conceptual multi-layered framework of international entrepreneurship by incorporating another encompassing layer to the framework, the rapidly emerging online global marketplace.
International Business	Strange & Zucchella, 2017	Conceptual	This paper aims to provide an assessment of how the widespread adoption of new digital technologies (i.e. the Internet of things, big data and analytics, robotic systems and additive manufacturing (3-D printing)) might affect the location and organisation of activities within global value chains (GVCs).
International Business	Coviello, Kano & Liesch, 2017	Conceptual	This study focusses on two critical dimensions absent from Vahlne and Johanson's (2017) arguments: the impact of the digital context as a defining macro-level feature of the modern world, and the role of the individual as a core microfoundation of the internationalization process.
Management	Nambisan, Lyytinen, Majchrzak, & Song, 2017	Conceptual	This is an introductory paper whose objective is to lay bare the broader implications of digital innovation for research in innovation management. How should organizations engage in and enhance their innovation outcomes and processes in the digital world.
International Entrepreneurship	Amit & Han, 2017	Conceptual	This study proposes a new conceptualization of a firm's resource configuration decision in a digitally enabled world. The digitalization of businesses allows entrepreneurs and managers alike to reimagine the boundary of their resource configurations and, thereby, enhance the value-creation potential of resources.
Management	Li, Su, Zhang & Mao, 2017	Qualitative Sample: 7 SMEs e-commerce on the Alibaba Digital Platform.	This research investigates how entrepreneurs of small and medium enterprises (SMEs) with inadequate capabilities and limited resources drove digital transformation in their companies.

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International Entrepreneurship	Autio, 2017	Conceptual	This article presents a normative framework (Strategic Entrepreneurial Internationalization) that articulates how INVs can leverage internationalization to drive competitive advantage.
International Business	Schu & Morschett, 2017	Quantitative. Sample: 140 online retailers in Europe	This article examines the foreign market selection on on-line retailers. These authors define a path dependent perspective on influence factors.
Management	Yonatany, 2017	Conceptual	This paper proposes a theoretical link between International Business theory and the literature related to the platform-ecosystem organizational form. It emphasizes implications for psychic distance, liability of foreignness, and speed and pattern of internationalization.
International Entrepreneurship	Parente, Geleilate and Rong, 2018	Conceptual	This article focusses specifically on internet-based firms that allow rent appropriation from temporary utilization of underutilized assets. By looking at these firms' main characteristics and the current dynamics revolving around their internationalization process, the authors develop a framework to guide future research drawing from a business ecosystems perspective.
International Business	Chen, Shaheer, Yi & Li, 2018	Quantitative Sample: 24 apps from 8 subcategories (longitudinal cross-country database)	The study explores a user-network perspective and externalization logic, suggesting that ibusinesses' internationalization process depends critically on users' collective interactions, instead of being solely driven by firms' market commitments, as noted by the Uppsala model.
International Entrepreneurship	Hänninen, Smedlund & Mitronen, 2018	Literature review, conceptual analysis and qualitative case study Sample: 4 multi-sided digital platforms (Alibaba Group, Amazon.com, eBay and Rakuten Group)	This paper explores how multi-sided digital platforms are transforming the retail exchange logic and assess the implications and impact of these platform-based business on the retail sector, especially for business managers and consumers.
Management	Büyüközcan, & Göçer, 2018	Systematic Literature review based on academic literature, published books, industrial reports, Thesis, Websites, Conference Proceedings	This article reviews the state-of-the-art of existing Digital Supply Chain (DSC) literature

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Management	Köning, Ungerer, Baltes & Terzidis, 2018	Quantitative. Sample: 837 business plans collected between 2000 and 2016	This paper investigates evolution patterns of digital and non-digital business models. The objective of this paper is to compare patterns of business model evolution in digital and non-digital venture industries and to shed some empirical light on the usefulness of combining The Business model canvas (BMC) and the lean start-up manifesto (LSM) methods.
International Business	Ojala, Evers, & Rialp, 2018	Qualitative: longitudinal, exploratory single-case study	This article examines how Digital platform providers internationalize their services. The findings shed light on the relationship between technology and internationalization by demonstrating that the internationalization of digital platform providers is moderated by a variety of technical and strategic bottlenecks in the market.
International Business	Wittkop, Zulauf, & Wagner, 2018	Qualitative Case study Sample: 6 internet-based firms (B2B, B2C, C2B)	The purpose of this article is to develop a comprehensive understanding of how internet-based companies (IBC) internationalize in the digital market.
International marketing	Watson IV, Weaven, Perkins, Sardana, & Palmatier, 2018	Literature review, conceptual analysis	This article investigates the effect of Digital technologies and the changing global business environment to understand how relational approaches to international market entry (IME) are changing considering macro developments.
International Entrepreneurship	Autio, Nambisan, Thomas & Wrigh, 2018	Conceptual	This study explores the theoretical and conceptual underpinnings of the entrepreneurial ecosystem phenomenon and propose directions for further research. The authors compare the entrepreneurial ecosystem concept against theoretical constructs evoked in the economic geography, innovation, and management literatures.
International Entrepreneurship	Grochal-Brejda & Szymura-Tyc, 2018	Qualitative, single case study (longitudinal. Sample: three e-commerce micro firm (from inception)	The study presents a holistic description of the internationalisation process of an entrepreneurial e-commerce firm. The simultaneous involvement in the inward and outward forms of internationalisation enhances the development of knowledge necessary for further internationalisation of e-commerce firms.

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International Entrepreneurship	Shaheer & Li, 2018	Quantitative. Sample: 127 Apps at Apple's store Health and Fitness in 50 countries	This paper analyses some salient factors affecting the internationalization speed of digital innovations by tracking international penetrations of 127 apps at Apple's app store. Although apps are globally available via online platforms, their international penetration is still subject to cultural, administrative, geographic, and economic (CAGE) distances that act as user adoption barriers to impede app internationalization.
International Business	Vendrell-Herrero, Gomes, Collinson. Parry, & Bustinza, 2018	Quantitative Sample: a survey with 5,200 usable data points from consumers residing in fourteen geographically dispersed countries.	This article investigates, through the country-of-origin effect and value-in-use lenses, how the implementation of digital services creates opportunities for cultural industries to expand internationally. This study employs a unique consumer dataset with information on the internationalization of British cultural digital services.

3.2 Procedures for the thematic analysis

The procedures of data organization comprised the creation of an excel workbook to record and compare articles in chronological order. Each article was provided with a protocol number. Then, we content-analyzed each article to collect the following data: authors, title, year of publication, journal source, volume, issue, pages, and article type (review, conceptual, or empirical). In addition, in a following step, we extrapolated the aim of the study and findings. Based on this information, all articles (both conceptual and empirical) were labelled in the research trends analyzed above: digitalization, digital firms and digital internationalization process. This classification was made inductively to facilitate the thematic analysis.

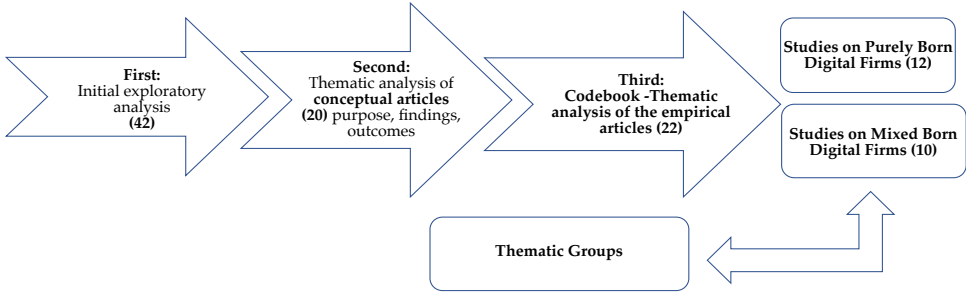
Inspired by the methodology adopted in previous reviews (Fisher and Reuber, 2011) we collected and codified some additional data to support the thematic analysis of empirical articles: (a) "digital" firm's types analyzed, (b) methodological approach, (c) sample (number and characteristics of firms analyzed), (d) keywords, (e) key research findings, (g) industry, (h) country of research. Compared to previous works, some of these fields, like "sample size" and "venture types," were recently introduced.

We developed a thematic analysis and synthesis in three steps: first, we carried out an initial exploratory analysis aimed at pointing out some general features of the literature, the number of articles, article types, methodologies, country of research. In a following step, we conducted a thematic analysis of

conceptual articles based on purpose, findings, and the outcomes of each article. Thereafter, through the data organized in the codebook, we carried out the thematic analysis of the empirical articles. The above-described steps are presented in Figure 1. Given the numerous operational definitions existing in the literature (Coviello et al., 2017; Mahnke and Venzin, 2003, UNCTAD, 2017) and the variety of sampled firms, we choose to analyze the characteristics of firms analyzed in each article, in order to identify the papers that researched born digital firms specifically and separate them from the rest of the articles, which, instead, had a different prevailing focus. Driven by the goal of creating mutually exclusive categories, we established a criterion on which we based the categorization of works: the characteristics of sampled firms and theories adopted in each work.

As a result, through a preliminary reading of the selected articles, we inductively identified two categories of articles regarding the type of digital business model: (1) studies on purely born digital firms, and (2) studies on mixed born digital firms (online born-commerce firms). As a further step, we analyzed the purpose and findings of each empirical study and we identified some thematic groups inside these two categories. Each article was categorized in one of these thematic groups.

Fig. 1: Procedures for the thematic analysis



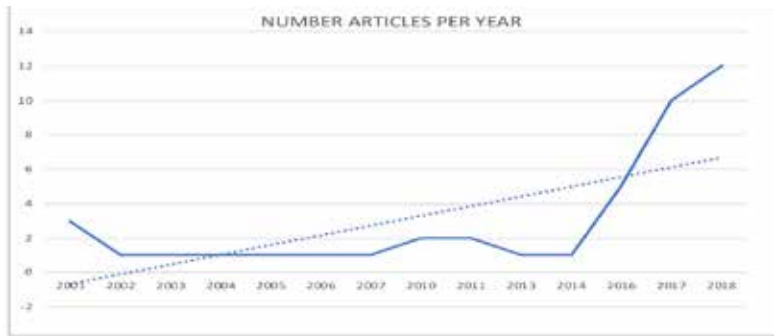
4. Findings and Discussion

4.1 State of the art

This section offers figures on some descriptive elements of the sampled articles. The distribution of articles per year reveals that the topic is extremely young. At first view, the analysis of articles immediately confirms the increased academic interest in born digital firms and their internationalization over the years, as illustrated in Figure 2. The number of articles ranges from 11 in ten years (from 2000 to 2010) to 12 articles in the last year (2018). The results indicate that the number of articles has increased especially since 2014, although the first article appears in the year 2001, in the period between 2000

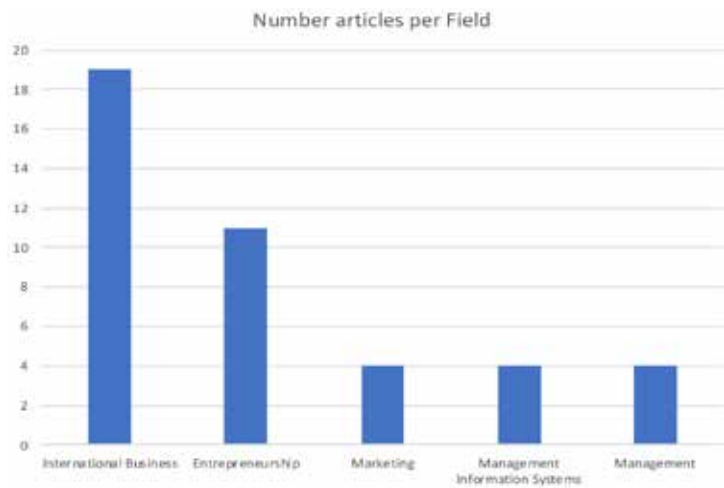
and 2010 the publications are not constant in time and only eleven articles are published in ten years. In the last two years, we find 52% of articles published.

Fig. 2: Number of articles per year



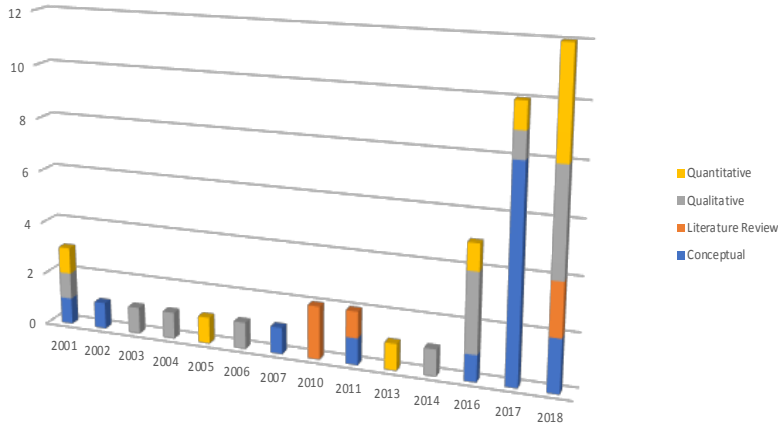
Most of the articles were published in the research field of International Business (19) and Entrepreneurship (11) which all together represent 71% of the literature here analyzed, as illustrated in Figure 3.

Fig. 3: Number of articles per research field



As we mentioned above, the dataset of 42 articles is comprised of the 5 reviews, 15 conceptual studies, and 22 empirical studies, 13 qualitative and 9 quantitative studies. Comparing the type of articles published across the period analyzed, the conceptual studies raise from 2017 providing theoretical and operational definitions around the concept of born digital firms and their internationalization. The empirical studies were 49% of the total articles analyzed, most of them published in 2018, as illustrated in Figure 4, possibly due to the novelty of the topic.

Fig. 4: Typology of studies per year



4.2 Thematic analysis and discussion

We conducted a thematic analysis of conceptual articles based on purpose, findings, and the outcomes of each article (22 articles). Thereafter, we carried out the thematic analysis of the empirical articles. The empirical studies were categorized within two categories according to the characteristics of the firms analyzed and labels adopted, namely, (1) studies on purely born digital firms (12 articles), (2) studies on mixed born digital firms (e-commerce firms) (10 articles).

4.2.1 Conceptual articles, reviews, and theoretical models developed on born digital firms

The limited existing literature of International Business and Entrepreneurship on digitalization is highly fragmented across multiple streams of research. From the first decade of research, the conceptual studies and reviews were attempting to set up most salient International Business (IB) concepts and describing the probable range of impacts that digital ICT revolution might bring to bear on their fundamental assumptions (De la Torre and Moxon, 2001). Most of these studies addressed the internationalization process of new internet-based companies, in a broad sense, but not specifically to born digital firms, as we defined above.

One stream of research of International Business, which draws primarily on *internalization theory*, has analyzed the role of digital ICTs in coordinating and supporting the international activities of MNEs (Alcacer, Cantwell, and Piscitello, 2016; Coviello, Kano, and Liesch, 2017). This literature has emphasized what firm-specific factors are associated with the propensity of internet-based companies to enhance their international presence

in Internet by developing country-specific websites (Kotha, Rindova and Rothaermel, 2001). Advances in digital ICTs may change the relative attractiveness of different foreign operating modes, by improving communication channels, providing easier access to market information, and allowing for better remote monitoring of operations (De la Torre and Moxon, 2001). For digital firms, in particular, ICTs should greatly diminish the need for market-seeking FDI. As their digital products face minimal transportation costs and relatively few trade barriers when distributed over the internet, digital firms can serve foreign markets by exporting from their home country (Mahnke and Venzin, 2003; Nachum and Zaheer, 2005; UNCTAD, 2017). Accordingly, the extant literature has stressed the potential for born digital firms to enter foreign markets without establishing a physical presence abroad, and without physical products crossing borders, using what has been labelled “online,” “internet-based,” “virtual” or “remote electronic access” internationalization (Pezderka and Sinkovics, 2011; Yamin and Sinkovics, 2006; Strange and Zuchella 2017). Moreover, the findings of these studies are based on a wide range of industries, including manufacturing, which raises doubts about their applicability to digital firms. Finally, while these studies suggest a reduced need for market-seeking FDI, they have not addressed what types of digital ICT-based operating modes born digital firms might use to replace traditional FDI-based approaches.

The second stream of research is predominantly based on *internationalization process theories* and the impact of digital ICT conducting the international business. IB research on digital firms has mainly applied two broad types of internationalization process: the Uppsala model, as well as research more recently on INVs and born global firms as we mentioned above.

Most of the conceptual studies in this stream of research, have developed conceptual models or constructs on not purely born digital firms, named internet-related firms (Reuber and Fisher, 2011; Forsgren & Hagström, 2007; Onetti, Zuchella, Jones, & McDougall-Covin, 2010), or new wave global firms (Bell and Loane, 2010). This research has often focused on a relatively narrow set of website-based businesses, such as “online portals”, which may not be representative of today’s digital firms (Reuber and Fischer, 2011). Conceptual models on purely born digital firms remain relatively scarce.

Several articles have reviewed the IB research field treating the sub-field of *speed of internationalization and entry modes* through digital technologies. Compared to traditional modes of foreign market entry, “virtual internationalization” greatly reduces the cost and risk of expanding internationally (Autio and Zander, 2016; Pezderka and Sinkovics, 2011; Knight and Liesch, 2016; Watson IV, Weaven, Perkins, Sardana, and Palmatier, 2018; Parente, Geleilate and Rong, 2018; Yonatany, 2017). As a result, the risk-mitigating incremental approach to internationalization may be less important, allowing digital firms to enter a large number of foreign markets early in their ex-

istence (Yamin and Sinkovics, 2006). Born digital firms also face pull-factors favouring rapid and extensive internationalization. The scalability and low marginal costs associated with digital goods and services create a strong incentive to serve a larger market, to reap economies of scale (Forsgren and Hagstrom, 2007; Parente, Geleilate and Rong, 2018). Some studies argue that the behaviour of new types of firms like Internet-related firms might deviate considerably from what the Uppsala model predicts (Forsgren and Hagström, 2007). However, as we discuss below, several empirical studies propose that born digital firms are not immune to differences between countries in terms of cultural, administrative, geographic, and economic (CAGE) distances that act as user adoption barriers to impede virtual internationalization (Shaheer and Li, 2017).

From a different perspective, several articles have reviewed the *International Entrepreneurship* (IE) research field (Amit and Han, 2017; Autio 2017), treating the subfield of Resource based View (RBV) and how digitalization of business allows entrepreneurs and managers alike to reimagine the boundary of their resource configurations and, thereby, enhance the value-creation potential of resources. Autio (2017) develops a Strategic Entrepreneurial International framework (SEI) that argues that INVs that adopt and active learning orientation, harness digital infrastructures for cross-border business model experimentation, encapsulate cross-border asymmetries in their activity system, and adopt a niche orientation are more likely to succeed in building sustainable competitive advantage.

In a similar vein, other works have focused on factors impacting on the likelihood of internationalization of new ventures, stressing the influence of entrepreneurs' digital capabilities (Nambisan, 2017; Etemad, 2017). *Digital Entrepreneurship* is generally referred to as the pursuit of opportunities based on the use of digital media and other information technologies (IT) (Reuber and Fisher, 2011).

Even though digital entrepreneurship can occur through the formation of a new firm or the transformation of an existing firm, studies have mostly focused on new firms. Moreover, digital entrepreneurship research recognizes that digital technologies affect individual entrepreneurs by reshaping their mentality (Di Domenico et al., 2014) and studies have been focusing on the new enabled conditions that lower the risk of entrepreneurial activities (Kelestyn and Henfridsson 2014). With the advent of Internet and the emergence of online global markets, entrepreneurial activities of on-line actors, and online intermediaries, regardless of their initial motives, time and location, have impacted the path of international market developments in general and entrepreneurial internationalization (Etemad, 2017). For example, Reuber and Fisher (2011) proposed a conceptual framework in which on-line technological capabilities are a resource related to a firm's successful pursuit of international opportunities. At the individual level

of analysis, this resource may be complemented with the use of social media by founders and the online human branding of founders, to identify international opportunities and mitigate uncertainties. Nambisan (2017) examines how the new digital technologies have transformed the nature of uncertainty inherent in entrepreneurial processes and outcomes. Digitalization creates social data (market networks) and intellectual data (market knowledge) about foreign markets earlier and faster than other methods, while also improving firms' attractiveness, decision processes, and capabilities of decision makers (Clark et al., 2018). Although decisions are often based on historical data or on experiences from other markets, a new market entry is a long-term investment in the future attractiveness of an untested foreign country (Neubert, 2017). This has raised important questions at the intersection of digital technologies and international entrepreneurship.

Digital technologies manifest in the realm of entrepreneurship in the form of three distinct but related elements—digital artifacts, digital platforms, and digital infrastructure (Nambisan et al., 2017). In this analysis, digital artifacts and digital platforms serve as part of the new venture idea (outcome) while digital infrastructure serves as an external enabler (supporting the process). The discussion of how the characteristics and other aspects of these digital technology elements affect the entrepreneurial process should be questioned, for example, why are some entrepreneurs (ventures) more successful than others in acquiring entrepreneurial resources through digital crowdsourcing and crowdfunding systems? How does the use of digital infrastructure (e.g., social media) by different entrepreneurs lead to different types of effectual cognitions and behaviours (and consequently different outcomes)? This research provides one important starting point addressing these questions, by examining the role of specific aspects of digital technologies in shaping international entrepreneurial opportunities, decisions, actions, and outcomes.

Drawing on *Business Models theories*, a new-born research stream has suggested new theoretical frameworks for born digital firms (Yonatany, 2017) and/or firms developing their business model around a new technological platform (Onetti, Zuchella, Jones, and McDougall-Covin, 2010). Strange and Zuchella (2017) provide an assessment of how the widespread adoption of new digital technologies (i.e. the IoT-Internet of Things, big data and analytics, robotic systems and additive manufacturing) may affect the location and organization of firm' activities within global value chain. Global Value Chain concept particularly is referring to adoption and impact of the new digital technologies (commonly known as Industry 4.0). The authors consider the implications of the technologies for IB theory and, in particular, for the nature of ownership, location and internalization advantages experienced by multinational enterprises (MNEs). Indeed, these articles have stimulated new reflections on the mechanisms and fac-

tors that drive born digital firms to engage and enhance their innovations outcomes and processes in the digital world.

In conclusion, there are few *conceptual articles based on purely born digital firms*. Most of these works enhance the IB research and underline its borders by merging concepts from new digital technologies (Strange and Zuchella, 2017; Watson IV, Weaven, Perkins, Sardana, and Palmatier, 2018), providing a taxonomy of digital international market entry strategies. Other works have made impressive efforts to advance in the sub-field of internationalization speed (Forsgren and Hagström, 2007). Others conceptual studies have extended the IB research borrowing concepts from other domains (e.g., management information systems, marketing,) and integrating different theories (Autio, 2017, Etemad, 2017; Reuber and Fisher, 2001). Table 3 summarizes the themes examined in the conceptual articles.

Tab. 3: Conceptual papers advancing theory on born digital firms

Conceptual papers advancing theory on born digital firms and their internationalization
<p>Themes</p> <p>International Business Theories</p> <p>Internalization: Singh & Kundu (2001); Coviello, Kano, & Liesch (2017); Alcácer, Cantwell, & Piscitello (2016); Bell & Loane (2010)</p> <p>Speed and Entry modes: Uppsala theories vs Born Global/INVs</p> <p> Purely digital firms: De la Torre & Moxon (2001); Yonatany (2017); Parente, Geleilate, & Rong (2018)</p> <p> Others (internet related firms): Forsgren & Hagström (2007); Pezderka & Sinkovics (2011)</p> <p> Watson IV, Weaven, Perkins, Sardana, & Palmatier (2018)</p> <p>Networks/Models on Social Media Networks: Reuber & Fischer (2011); Alcácer, Cantwell, & Piscitello (2016)</p> <p>Resource Base View: Amit & Han (2017); Autio (2017)</p> <p>Entrepreneurship Research</p> <p>Digital Entrepreneurship: Nambisan (2017); Etemad (2017); Autio, Nambisan, Thomas & Wrigh (2018)</p> <p>Business Models Theories</p> <p>Digital Business Models: Onetti, Zuchella, Jones, & McDougall-Covin (2010)</p> <p>Digital Suply Chain: Büyüközcan & Göçer (2018)</p> <p>Global Value Chain: Strange & Zuchella (2017); Nambisan, Lyytinen, Majchrzak, & Song (2017)</p>

4.2.2 Thematic analysis of empirical articles on purely born digital firms and their internationalization

A better explanation of similarities and differences among purely born digital firms

This category includes studies focused on purely born digital firms, referring to all the companies that internationalize through digital ICTs from

inception and whose products and services are digital (Mahnke and Venzin, 2003). The empirical studies are illustrated in Table 4.

Tab. 4: Empirical studies on “purely born digital firms and their internationalization”

<i>Empirical studies on purely born digital firms and their internationalization</i>
Themes
Factors influencing speed, geography: Kotha, Rindova & Rothaermel (2001); Wentrup (2016); Shaheer & Li (2018); Vendrell-Herrero, Gomes, Collinson, Parry, & Bustinza (2018)
Factors influencing entry modes: Mahnke&Venzin (2003); Brouthers, Geisser, & Rothlauf (2016)
Network Theories, Social Media and Diffussion of Innovation: Fischer & Reuber (2014); Brouthers, Geisser, & Rothlauf (2016); Chen, Shaheer, Yi, & Li (2018); Ojala, Evers, & Rialp (2018)
Digital Business Models/ Value Creation: Hazarbassanova (2016); Köning, Ungerer, Baltes, & Terzidis (2018); Wittkop, Zulauf, & Wagner (2018)

Hence, we focus on ibusiness firms as a special type of e-business companies that use the Internet and other Computer Based Information Systems (CBIS) technologies to provide an Internet-based platform, which allows users to interact with each other (Brouthers, Geisser, and Rothlauf, 2016). These firms provide a platform that allows users to buy and sell products/services (marketplaces transaction brokers) to each other or exchange information (virtual communities) with each other. iBusiness firms generate value by providing the platform and organizing the input of users as well as manage the cross-relationships of the various users. Representative examples of ibusiness firms include social network sites like facebook.com or linkedin.com, which offer a platform for private as well as corporate users to communicate and interact with each other; job websites like monster.com or indeed.com, which allow job seekers and hiring companies to interact with each other; travel sites like hotel.com or tripadvisor.com, which match user demand with the offers of travel service providers.

Other studies (Ojala, Evers, and Rialp, 2018), focus on a new and increasingly important group of firms, namely *digital platform providers*, refers to digital-based INVs developing digital platforms. Digital platforms can be defined as “a shared, common set of services and architecture that serves to host complementary offerings” (Nambisan, 2017, pg. 1032). By using services offered by firms developing and marketing digital platforms, it can listen to music as a service through Spotify or iTunes, watch movies through Netflix, or rent a house in a foreign country through Airbnb. This study posit that the internationalization process of digital platform providers represents a particular case of internationalization.

In a similar vein, Hazarbassanova (2016) proposes that “pure play digital service firms” differ in what their motivation to internationalise, how they deal with their liability of foreignness and how they learn to internationalise. The differences are consistent with the specificities of their value creation.

In this study, Internet firm is defined as a “for-profit organization, which conducts its business exclusively through an Internet-based platform, in a way that if the central servers of the firm are turned-off, the business of company will be interrupted” (Hazarbassanova, 2016, pg. 350). From this, it follows that the core product of the firm must be digital, consisting only of data distributable over digital channels. Based on this definition, we also include in this category empirical studies of firms that offer digital products, termed as digital innovations, which become instantly available across the globe via online platforms. (e.g., mobile apps and online software) (Shaheer and Li, 2018; Chen, Shaheer, Yi, and Li, 2018). This selection is also based on the ibusiness definition provided by Brouthers et al., (2016).

Hence, integrating products characteristics of digital products and services is an important variable in the explanation of internationalization patterns for born digital firms.

Speed and sequence of internationalization process by purely born digital firms

There is little empirical evidence on whether purely born digital firms internationalize faster or slower than manufacturing firms. Some studies suggest that this category of companies is internationalized soon after their outset, which means that the speed of time to first entry is fast (Wentrup, 2016). This behaviour is supported by the born global theory internationalization (Oviatt and McDougall, 2005), and other studies on digital-based international new ventures (Ojala, Evers, and Rialp, 2018), that extent the scope of INV theories where firms internationalize proactively and rapidly after inception.

A driver behind the swift international expansion among born digital firms is the rapid speed and competition in the sector. It is generally stressed, and there is an underlying assumption in the industry, that first-mover advantage is crucial. Chen, Shaheer, Yi, and Li (2018) refer to this as the phenomenon of “winner takes it all”. The online industry is characterized by a pattern in which leading firms capture a disproportionate share of the market during a short time span via network effects, and this puts pressure on competing firms to engage in rapid internationalization. Additionally, in the case of digital start-ups, Shaheer and Li (2018) argue entry barriers may not impede offering its digital innovations. These firms can join globally accessible online platforms that internalize many barriers to internationalization, such as the presence into foreign markets, payment mechanisms, and trust between businesses and users (Autio et al., 2018; Nambisan et al., 2017). Affiliation with such platforms grants digital innovations global accessibility from inception with little or no barriers to entering foreign markets.

This is also evident in terms of “sequencing” or, in other words, the pace of subsequent market entries: the firms keep a high pace going in the early phase of internationalization. Online consumer mobility means that

companies are pushed to act fast to attain a critical mass of customers and manage the competition, leading to compressed sequencing (Brouthers, Geisser, and Rothlauf, 2015). This is in line with the theory of the internationalization of other type of Internet firms (Yamin and Sinkovics 2006; Sinkovics et al., 2013) that we discuss below.

However, empirical research has shed light into some critical factors that affecting the rapid pace of internationalization. In this sense, Wentrup (2016) emphasizes the balance in the internationalization process between an online and offline presence (“online-offline interval”). There seems to be a limit on how long a born digital firm can operate fully online without needing a physical presence. This study reveals the importance of home markets as a springboard, and of regional expansion in the early phase of internationalization. In addition, low entry barriers for online entry must be considered in relation to barriers in the offline context (e.g., legal compliance and market-specific requirements). In the case of digital platform, other studies indicate that the early internationalization and subsequent foreign market entries are governed by layered modular architecture, (Ojala, Evers, and Rialp, 2018), and its dependent on the platform provider’s capability to replicate a workable architecture stack in a target country. Therefore, main barriers faced by platform companies in their internationalization endeavours are the weaknesses of local technological infrastructure, the lack of complementary asset providers, and local regulations (Parente et al., 2018).

Regarding digital firms producing digital innovations, there are some salient factors affecting the internationalization speed. Although these category of born digital firms are globally available via online platforms, their international penetration is still subject to cultural, administrative, geographic, and economic (CAGE) distances that act as user adoption barriers to impede firm’s internationalization. These companies may overcome these barriers by employing the demand-side strategies of engaging users in value co-creation (Shaheer and Li, 2018). In this sense, the CAGE distances in cyberspace may act as “user adoption barriers”, instead of market entry barriers.

Explaining entry modes by purely born digital firms

As we mentioned above, integrating products characteristics of digital products and services is an important variable in the explanation of the entry modes of internationalization patterns for born digital firms. Purely born digital firms seek to enter foreign markets through entry modes that allow control in branding and advertising strategies, because of the “experience character of digital goods” (Mahnke and Venzin, 2003). Thus, entry modes may be chosen to seek control regarding possibilities of customer education rather than overcoming the hazards of liabilities of foreignness, consider as a bilateral factor. In a similar vein, Wentrup (2016) argues

that born digital firms prefer to enter international markets via controlled modes (e.g., subsidiaries). This is due to a network effects as well as the nature of online service itself, with a technical complexity.

However, some born digital firms are more likely to assume that online interactions generate insights not only on buyer behaviour and preferences, but also about the underlying market conditions that shape customer preferences and behaviour. The possibility of a “virtuality trap” is stronger in the case of digitalised products compare to non-digitalised products (Yamin and Sinkovics, 2006). By virtuality trap, these authors mean a perception by the internationalising firms that the learning generated through virtual interactions obviates the need for learning about the target market. Thus, digital internationalization is likely to engender a perception of reduced psychic distance.

Since the core offerings of born digital firms are “fully digital” (providing a platform for connecting users), and are transferred over electronic networks, they are instantly accessible from anywhere in the world (Brouthers, Geisser, and Rothlauf, 2016). Due to the cost of transferring from one country to another are relatively small, born digital firms will be influenced to a lesser extent by investment risks related to Liabilities of Foreignness (LoF) (Johanson and Vahlne, 2009). In contrast, digital firms should deal with greater Liabilities of Outsidership (LoO), since the main concern is the creation of a large enough network of users to generate value on its platform, and create thick ecosystems in new countries (Brouthers et al., 2016). Such research would also require a clearer understanding of related factors such as the role of networks and ecosystems, as discussed below.

*The social network theories and diffusion of innovation
by purely born digital firms*

Recent empirical studies (Kotha et al., 2001; Brouthers, et al., 2016; Chen et al., 2018; Fisher and Reuber, 2014; Vendrell-Herrero et al., 2018) analyze how user networks may affect digital firms’ internationalization about country penetrations and how these firms explore the way in which they may build competitive advantages. These studies focus on social network theories and diffusion of innovation theories perspective to analyse how born digital firms may be focus on learning to overcome issues of user-network outsidership by using its existing social network and diffusion of innovation as mechanisms to persuade potential users to adopt the firm’s platform in the foreign market. As we mentioned above, digital firms should deal with greater Liabilities of Outsidership (LoO), because of the lack of embeddedness in the foreign market community. Liabilities of Outsidership, in general, refer to the fact that the internationalization process of a firm is conditioned by its acceptance into segmented business

networks (Johanson and Vahlne, 2009). This is because this theory conceptualizes internationalization as a prolonged process of knowledge development. In the context of born digital firms, a fundamental characteristic is that these firms do not fully control what users or third-parties do or build on their platforms, but instead generate value through maintaining and channelling the exchanges between various participants. The main concern is the creation of a large enough network of users to generate value on its platform. Hence, the success of a born digital firm lies in its ability to encourage mass-market adoption and build a large user network as well as diffusion of the novelty of its offerings (Brouthers, Geisser and Rothlauf, 2016; Chen, Shaheer, Yi, and Li, 2018).

Communication channels are an important element of diffusion on innovation (Fisher and Reuber, 2014) to reduce uncertainty and enhance differentiation. The role of opinion leadership in product diffusion has been long recognized (Iyengar, Van den Bulte, and Valente, 2011). In online social networks, individuals with a larger number of social ties have greater impact on the overall speed and number of adoptions. Drawing upon the notion of country clout, Chen et al., (2018) extend this literature to the user-network level and focus on diffusion across countries. The widespread adoptions in high-clout countries enhance the substantive network benefits that potential adopters in other countries can derive from joining a new network. In a similar vein, other studies (Vendrell-Herrero, Gomes, Collinson, Parry and Bustinza, 2018) evaluate the country of origin, cultural distance, exoticness, brand image, and flag-brand, and how these factors influence positively the purchasing decision of consumers that are hesitant when making a purchase of culturally-based digital services (e.g., music (Apple Music, Spotify), or movies (Netflix)).

This line of research may represent an avenue for future inquiries. In this way, for instance, future research could clarify how these firms deal with their LoF and LoO and the specificities of their value creation, identifying internationalization patterns has not yet been explored.

Impact of business models components on purely born digital firms

A recent emerging theme pertains to Business Models of born digital firms. Digital Firms have been considered innovative firms (Brouthers et al., 2016). The impacts of value creation and delivery infrastructure (e.g., firm-specific capabilities and resources), the specific way of creating value and the individual customer interface used by a digital business play key roles in digital internationalization. On this theoretical basis provided, it is possible to develop a comprehensive understanding of how born digital companies are internationalizing and why their internationalization processes differ. Digitalization impacts on the business model as technologies enable

new ways of value creation and customer relationships. Exemplary is the customer segmentation based on interest-based factors, which is enabled by the analysis of big data derived from social networks (Hänninen, Smedlund and Mitronen, 2018). Digital companies often do not conduct market research before starting their international expansion. The costs and the risk of failure have decreased due to digitalization so that the advantage of trying to enter the market is considered superior compared with a long, costly, and incremental market entry (Autio & Zander, 2016). In this sense, the business model concept can help provide a structure to the large number of variables in the IB theories. A differentiation in the value proposition, value creation and delivery, and value capture is recommendable as a framework for a differentiation of internationalization strategies among different types of born digital firms (Witkop, Zulaf and Wagner, 2018). A differentiated analysis of digital firm's internationalization shows that born digital firms need to be considered as forming a heterogeneous group. Hazarbassanova (2016) proposes that the value creation process of born digital firms causes them to differ from each other, just as much as they differ from traditional firm. The relation of the value proposition to internationalization strategies has strong evidence but is not explained by IB or the IE theories. It has been confirmed that both the customer interface and the value creation logic are relevant variables. The value creation and delivery method is reflected in many of the traditional internationalization theories and remains crucial (Hazarbassanova, 2016). The value capture dimension (revenue model and financial aspects) is found to be less determining, as it itself is a determinant of the first two business model's components (Witkop, Zulaf and Wagner, 2018). Köningm Ungerer, Baltes, and Terzidis, (2018) analyse different patterns in the evolution of digital and non-digital ventures business models through the early stages of the business cycle. Digital ventures focus initially on developing transactions with their customers before searching investments in contrast with non-digital, that require investments beforehand to build capital-intensive assets for value creation.

Future research is needed for a deeper explanation of similarities and differences on business models of Born Digital Firms. That is crucial for a better understanding of strategic and operational implications and its internationalization process.

4.2.3 Thematic analysis of empirical articles on mixed born digital firms (e-commerce)

Types of e-commerce firms

This group of studies includes only full online and online-born commerce companies that internationalized shortly after their foundation. In our review, the studies related to e-commerce channel of traditional busi-

ness and multichannel retailer are excluded of this category. The empirical studies are illustrated in Table 5.

Tab. 5: Empirical studies on “mixed born digital firms”

<i>Empirical studies on mixed born digital firms</i>
Themes
Factors (micro and macro) influencing active online internationalization (speed, foreign market selection): Yamin & Sinkovics (2006); Sinkovics, Sinkovics, & Jean (2013); Schu, Morschett & Swoboda (2016); Schu & Morschett (2018); Luo, Zhao, & Du (2005)
Value creation: Amit & Zott (2001)
Leverage inward-outward capabilities/Network Theories: Loane, McNaughton, & Bell (2004); Grochal-Brejdak & Szymura-Tyc (2018)
Digital Business Models e-commerce platforms: Hänninen, Smedlund, & Mitronen (2018); Li, Shu, Zhang, & Mao
Digital Entrepreneurship: Li, Shu, Zhang, & Mao (2017)

There are few studies in which the issue of “virtual internationalization” is analysed (Grochal-Brejdak and Szymura-Tyc, 2018) regarding to online-born commerce companies. Most of them are mainly about the traditional firms which have started a direct sale through internet, complementing the prior sale executed by foreign intermediaries (Anderson, 2005; Sinkovics, Sinkovics, and Jean, 2013). Furthermore, the studies on mix born digital firms include a wide group of firms which are, in general, defined as enterprises engaged in electronic commerce from inception (Singh & Kundu, 2002), and with essential turnover derived from online transactions (Luo, Zhao and Du, 2005). E-commerce firms are highly differentiated by their main activity (trading, service and production firms), type of products offered (digital or tangible goods and services) to diverse customers, representing various e-business models (e-stores, international intermediary platforms (Alibaba, Amazon, Rakuten, eBay, etc.), having a different size, managed by the owner (entrepreneurial or family firms) or by professional managers. The e-commerce platforms (business-to-business, business to consumer or consumer to consumer platforms) allow firms and users to interact and buy and sell products online (Li, Shu, Zhang, and Mao, 2017). These authors also present new insights into how digital platform service providers can help Small and Medium Enterprises (SMEs) transform and compete, for example, helping entrepreneurs engage in new social networks, pushing to create, e.g. Chambers of Net Commerce. As a digital platform, back-end data processing is powerful. It provides to SMEs allow them to understand their visitors and customers better.

Their common characteristics is taking advantage of the Internet-based information and communication technologies (ICT) to expand sales domestically and internationally.

This category of studies, refers exclusively “active online internationalization” (AOI) (Yamin and Sinkovics, 2006; Harzabassanova, 2016; Sinkovics, Sinkovics and Jean, 2013), in contrast with “passive or default online” internationalization, that refers to firms with a domestic website, and which do not actively pursue or target foreign customers. In AOI, the internationalising firm creates websites intended as vehicles for conducting online business in particular foreign countries. Given the inherent risks of e-commerce, particularly in the cross-border context, AOI is likely to target countries that have reached ‘e-commerce readiness’ (Luo, Zhao, and Du, 2005,) in terms of adequate electronic infrastructures, credible payment systems and supporting legal and institutional structures (macro-level factors). In contrast to ‘default or passive’ online internationalisation, AOI can be considered as a significant investment in ‘entering’ a particular country or regional market. As such, it has features similar to traditional foreign market entry and international expansion, such as the relevance of intangible and firm-specific assets, as has been argued by Kotha et al., (2001) and Singh and Kundu (2002). However, there are also significant differences between traditional market entry and AOI.

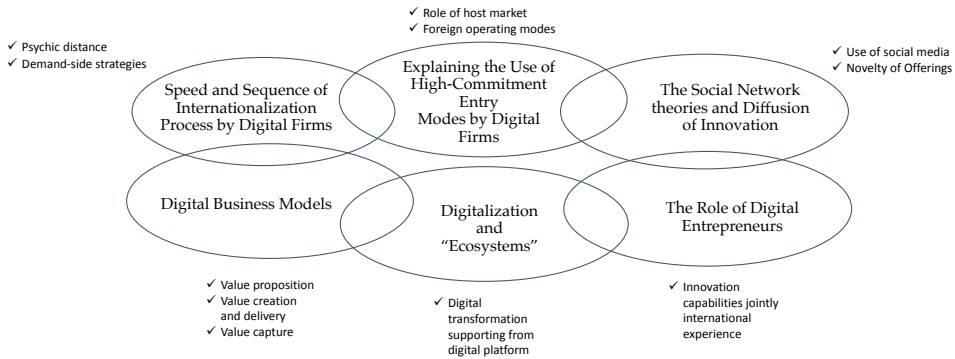
The fundamental difference between traditional market entry and AOI is that the latter does not necessarily entail any level of foreign investment in assets or activities. In AOI, the distinction between pre- and post-entry is blurred. Cyber-transactions with customers are for the most part managed from home. Thus, relative to traditional internationalisation, online internationalisation is more likely to be under the direct control of top level decision-makers who reside in the home country of the internationalising firm. It is, therefore, reasonable to conclude that compared to traditional internationalisation, AOI is a much more ‘home’-centred phenomenon (Yamin and Sinkovics, 2006). Regarding the sequencing of foreign market entry, AOI is likely to be much more time-‘compressed’ compared to traditional internationalisation. A consequence of near-simultaneous entry into several markets may be to reduce the extent of deliberate knowledge acquisition about markets to be entered. The two distinctive features, namely ‘market isolation’ and ‘dilution of sequencing’ (Yamin and Sinkovics, 2006) indicate that the online internationalisation is somewhat disengaged or disconnected from the business and institutional environment in the foreign market which it is entering, certainly compared to traditional market entry situations. These authors also propose that online internationalisation may induce a general reduction of psychic distance because of the experience of online interactivity is likely to generate insights on customer preferences and behaviour. However, the results of their empirical study demonstrate that facilitating effects of online internationalisation would not fully substitute for cultural and business learning associated with physical presence

in foreign markets (e. g., via export agent or an export office), and reduces the possibility of a ‘virtuality trap’. Like other Internet-based firms, the born-online commerce firms internationalise their activity easier and faster than traditional firms (Forsgren & Hagström, 2007), but their internationalisation paths might differ depending on various factors (Luo, Zhao, and Du, 2005; Yamin and Sinkovics, 2006; Sinkovics, Sinkovics, and Jean, 2013; Schu, Morschett and Swoboda, 2016; Schu and Morschett, 2017; Grochal-Brejda and Szymura-Tyc, 2018). Luo et al., (2005) analyse both micro-level (firm) and macro-level (host-country) factors affecting the speed of international expansion of born e-commerce companies, concluding that the speedy foreign market entry by e-commerce firms was positively influenced by top management team’s international experience, innovative and marketing capabilities. Depending the digital or non-digital nature of the product/service, Yamin and Sinkovics (2006) proposes differences in two distinct value chain contexts. In this sense, in the case of digital goods, the totality of the cross-border value-chain can be created online (e.g., software, music or online banking financial services) (Kotha, Rindova and Rothaermel, 2001; Mahnke and Venzin, 2003). When products and services are not digitalised (manufactured products), online internationalization refers only to those aspects of the value-chain that are conducted online (e.g., the sales and some after sales service and support). Regarding born online retailers of physical goods, Schu, Morschett and Swoboda (2016) highlight the imitability of an online shop as the most important factor influencing the internationalization speed. In the same context of firms, Schu and Morschett (2017) analyse the factors influencing the foreign market selection. The results indicate that market size, rule of law, and local market knowledge, as well as a common language and the logistics performance of a target country have a positive effect on the likelihood of selecting a target country. Although the Internet is said to reduce the impact of distance, both cultural and geographic distance as well as added geographic distance still show a negative impact on the selection of foreign markets by online retailer. From the analysis of multi-sided digital platforms (e-commerce) and the impact on the retail sector, Hänninen et al., (2018) suggest that platform-based business models are less capital intensive, easier to scale and more profitable in the long-term as their earnings model is based on selling services to their user base rather than just maximizing the sales margin. Since the research of mixed digital firms as a born-digital commerce firms remain scarce, future research could investigate how entry speed is jointly interacted with other entry decisions, and how such interactions impact overall evolutions of born e-commerce firms internationalization and overall consequences of foreign investments.

5. Trends and future research directions

The paper's goals were to conduct a systematic review to develop a more complete understanding of how the emergence of born digital firms presents a distinct phenomenon of an internationalizing enterprise, and to explore opportunities for future studies about firms' internationalization process from different lens. Our review of 42 studies demonstrates that there is no consensus on the definition of digital firms and their internationalization processes. Based on this systematic analysis, we develop suggestions for future research presented in Figure 5.

Fig. 5: Future research directions



Speed and sequence of internationalization process by born digital firms

Some studies suggest that online internationalization entails a more compressed version of the traditional internationalization process, in which the required resources commitment is reduced by the benefit of the Internet, while the specific market knowledge is obtained by learning-by-exporting. As a result, a faster internationalization process is observed among born digital firms, while the underlying mechanisms of market learning and network strategies may still apply. Moreover, such compressed internationalization processes may still also feature a dependence on various factors as suggested in Reuber and Fischer (2011) study of internationalization based on online reputation, online technological capabilities and online brand communities. More research into the precise nature of the psychic and other factors involved and how these affect online internationalization will be valuable. Furthermore, future research may focus on demand-side strategies based on social sharing and virtual community strategies to reevaluate the drivers behind the internationalization speed of born digital firms.

Explaining the use of high-commitment entry modes by born digital firms

Extant literature has stressed the potential for born digital firms to enter foreign markets without establishing a physical presence abroad, and without physical products crossing borders, using what has been labelled “online,” “internet-based,” “virtual” or “remote electronic access” internationalization (Pezderka and Sinkovics, 2011; Yamin and Sinkovics, 2006; Strange and Zuchella, 2010). However, other factors such as customer norms and habits could also create distances in the digital context. For instance, host country specific customers’ online purchasing behaviors such as pricing (Luo et al, 2005) could possibly disadvantage foreign firms lacking sufficient market or cultural knowledge to acknowledge such behaviours in the host market. Thus, it is suggested that these liabilities or distances do not fade in the digital context, instead, they could even be exacerbated when they are also constrained by liability of smallness and newness. Such local market specific features also highlight the need to gain local market knowledge, which in turn will possibly require a local presence as such market knowledge may not be fully available online. Hence, more research is needed to understand the role of host market presence and resource commitment by digital firms. Additionally, further research should investigate different foreign operating modes used by born digital firms and their potential variation among their internationalization patterns, integrating product/service characteristics.

The social network theories and diffusion of innovation

Another interesting avenue for future research is to link born digital firms up to the use of social media (possibly also linking up to the notion of “ecosystems” as discussed below). Social media is an emerging topic in international marketing (Reuber and Fischer, 2014) and there seem to be crucial but largely unexplored regarding to purely and mixed born digital firms. Digital internationalization process depends critically on users’ collective interactions, and their success lie in their ability to encourage mass-market adoption and build a large user network (Chen et al., 2018). Recent research proposes that the internationalization of born digital firms is conditioned by liabilities of user-network outsidership (Brouthers et al., 2016), yet the source of such liabilities has not been fully explored.

Future studies could focus on internationalization strategies of social media firms (e.g. Twitter, Instagram, etc.), social-media based branding strategies of global brands, use of social media as a vehicle for rapid internationalization, especially in culturally-based digital services. Future research could make investigate, also, the novelty of the firms’ offerings based on efficiency, complementarities and lock-in effects (Amit and Zott, 2001).

The role of digital entrepreneurs

The discussion of how the characteristics of digital technology elements affect the entrepreneurial process should be questioned, for example, why are some entrepreneurs (ventures) more successful than others in acquiring entrepreneurial resources through digital crowdsourcing and crowdfunding systems? How does the use of digital infrastructure (e.g., social media) by different entrepreneurs lead to different types of effectual cognitions and behaviours (and consequently different outcomes)? This research provides one important starting point addressing these questions, by examining the role of specific aspects of digital technologies in shaping international entrepreneurial opportunities, decisions, actions, and outcomes. Future studies may to investigate the effect of entrepreneurs' international experience jointly with their innovation capability and market orientation on the internationalization of born digital firms.

Digitalization and "ecosystems"

One important point raised by the literature on digital platforms is the potential importance of "ecosystems". The idea of business ecosystem highlights that there is an opportunity space that cannot be explored by individual firms but that requires multiple partners, collective action, alignment and convergence of vision towards an overarching value proposition (Li et al., 2018). These dimensions seem interestingly important for value co-creation in the context of increased internationalization within digital economies. Future research could analyse how entrepreneurs with inadequate digital capabilities and limited resources could drive their digital transformation to cross-border e-commerce supporting from digital platform service providers.

Digital business models

A differentiated analysis of digital firm's internationalization shows that born digital firms need to be considered as forming a heterogeneous group. Hazarbassanova (2016) proposes that the value creation process of born digital firms causes them to differ from each other, just as much as they differ from traditional firm. Using the value creation logic framework (e.g., value network, value shop and value chain) its potential to identify internationalization patterns has not yet been explored.

The IB theory has focused on variables such as efficiencies of the value chain, internal capabilities, and resource endowments. Some studies show that these theories still have high impacts on the internationalization strategies of born digital firms (Wittkopp et al., 2018). A differentiation in the value proposition, value creation and delivery, and value capture is rec-

commendable as a framework for a differentiation of internationalization strategies among different types of born digital firms.

Further research needs to investigate other variables to be considered in the highly dynamic digital markets. In addition to the impacts of value creation and delivery infrastructure (e.g., firm-specific capabilities and resources), the specific way of creating value and the individual customer interface used by a digital business play key roles in digital internationalization.

6. Conclusions, limitations and implications

This systematic review has investigated the important current issue of the emergence of international born digital firms regarding to the substantial literature on digital internationalization in International Business and Entrepreneurship spanning the last two decades. It is quite evident that the extant literature on the internationalization of digital firms is quite fragmented and disperse. However, although the literature on international born digital firms is still relatively small, it has been confirmed that digital firms are a very relevant context for rapid internationalization and tend to be INVs or born-global firms. However, the review has also demonstrated that traditional IB concerns highlighted by the Uppsala internationalization model such as the need for local market knowledge and the potential impact of cultural and institutional distance, and the Liabilities of Foreignness and Outsidership, remain valid in the digital context. Although born digital firms tend to internationalize more rapidly, there is also evidence that they are following a “compressed” sequential internationalization process whereby factors such as psychic distance still play an important role, and it may carry out to born digital firms making high resource commitments to host markets. Therefore, the present literature review has demonstrated that many issues related to born digital firms and their internationalization remain understudied yet.

This study, however, has also several limitations. Firstly, the selection of studies focused on the concept of digital firm may not be free of possible omissions given lack of clarity in the adoption of definitions of digital enterprise in the current literature. For this reason, the exclusion criteria used may seem subjective when trying to categorize the articles. Moreover, we acknowledge the limitations that stem from the exclusion of some sources (e.g., books, book chapters, and other journals) and from the choice of the keywords. The second limitation concerns the identification of categories and themes. Many of the studies refer to the digital enterprise as those that base their business model on digital technologies such as those that, although not strictly digital, use the Internet as a sales channel to internationalise. The two categories used are based both on the business model

provided by Brouthers et. al., (2016), as well as in the definition of the digital product/ service according to Mahnke and Venzin (2003). It could be interpreted by researchers that there are more categories, such as high-tech companies, knowledge intensive firms, or lean global start-ups (Neubert, 2018), as categories to be included. For example, in the case of studies on global start-ups, in which they are defined as a new international venture that create a new market niche using innovative technology and a new business model (Tanev, 2017), some doubts were raised. Although we selected articles related to these types of companies in the first selection of the 146 studies, we finally decided to exclude them because many articles published during the period 2000–2018 did not specify the samples' characteristics or did not properly adopt the digital firms labels in accordance with the firms' features. Thus, we excluded all those articles in which the products/ services of the sample were not digital, or because their business model was not included on the two categories provided by Brouthers et. al., (2016).

While primarily a guide for research, this review may also function as a practical guide for managers who seek to internationalize their digital new ventures. We shed light on the highlighted factors and strategies that drive active online internationalization and determine better international performance during the pre-entry and entry phases. Moreover, a branch of studies has highlighted how born digital firms may develop demand-side strategies based on social sharing and virtual community strategies to reevaluate the drivers behind their internationalization speed. Another important aspect concerns the benefits that born e-commerce companies may derive from their relationships with digital platforms, which may become fundamental in developing successful strategies in the international landscape.

Last, our study has confirmed the existence of born digital firms and rapid internationalization suggesting that this phenomenon remains an object of interest, which offers insights on how new and young digital ventures internationalize, but also on the failures and risks (e.g., virtuality trap), that these companies encounter during their evolution.

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